National Institute of Environmental Health Sciences

Climate change and temperature rise: Implications on food- and water-borne diseases

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Abstract:

This study attempts to quantify climate-induced increases in morbidity rates associated with food- and water-borne illnesses in the context of an urban coastal city, taking Beirut-Lebanon as a study area. A Poisson generalized linear model was developed to assess the impacts of temperature on the morbidity rate. The model was used with four climatic scenarios to simulate a broad spectrum of driving forces and potential social, economic and technologic evolutions. The correlation established in this study exhibits a decrease in the number of illnesses with increasing temperature until reaching a threshold of 19.2 degrees C, beyond which the number of morbidity cases increases with temperature. By 2050, the results show a substantial increase in food- and water-borne related morbidity of 16 to 28% that can reach up to 42% by the end of the century under A1FI (fossil fuel intensive development) or can be reversed to ~0% under B1 (lowest emissions trajectory), highlighting the need for early mitigation and adaptation measures.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Special Report on Emissions Scenarios (SRES) Scenario: SRES A1, SRES A2, SRES B1

Other Climate Scenario: A1B;A2;B1;A1F1

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal, Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Beirut, Lebanon

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease, Zoonotic Disease

Foodborne/Waterborne Disease: Cholera

Foodborne/Waterborne Disease (other): Dysentery; Hydatic Cyst; Parasitic worms; Trichinosis; Typhoid fever; viral Hepatitis A

Zoonotic Disease: Brucellosis

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Long-Term (>50 years)

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content